



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,766	12/09/2003	Reid Edmund Tatge	TI-35556	4307
23494 7590 03/06/2008 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			EXAMINER WANG, BEN C	
			ART UNIT 2192	PAPER NUMBER
			NOTIFICATION DATE 03/06/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com  
uspto@dlemail.itg.ti.com

**Office Action Summary**

Application No.

10/731,766

Applicant(s)

TATGE ET AL.

Examiner

Ben C. Wang

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Applicant's amendment dated September 28, 2007, responding to the Office action mailed March 8, 2007 provided in the rejection of claims 1-18.

Claims 1-18 remain pending in the application and which have been fully considered by the examiner.

Applicant's arguments with respect to claims rejection have been fully considered but are moot in view of the new grounds of rejection – see both *Carl D. Burch* (Pat. No. US 6,308,320 B1) and Navin Kumar Sinha (Pub. No. US 2003/0079209 A1) - arts made of record, as applied hereto.

***Claim Rejections – 35 USC § 102(b)***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(b) that form the basis for the rejections under this section made in this office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 3-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Carl D. Burch (Pat. No. US 6,308,320 B1) (hereinafter 'Burch' - art made of record)
3. **As to claim 1**, Burch discloses a code generating system, comprising:

- a compiler (e.g., Fig. 3A, block 107 – Source Compilers) that receives source code (e.g., Fig. 3A, block 118 – Source Code) and generates an object file (e.g., Fig. 3A, block 120 – Object Code) comprising object code and intermediate code (e.g., Fig. 3A, blocks 122 – Intermediate Code, and 120 – Object Code; Col. 8, Lines 36-42 - .. the object file ... included in the intermediate code file by including execution instructions in the object code stream);
- a code optimizer coupled to the compiler (e.g., Fig. 3A, block 109 – Optimizer); and
- a linker (e.g., Fig. 3A, block 112 – Linker) that receives the object file comprising object code and intermediate code and provides the intermediate code to the code optimizer (e.g., Fig. 3A, blocks 304 – Linker Invokes; 112 – Linker, 113 – Intermediate Code Generator, and 122 – Intermediate code 122; Col. 8, Lines 8-11 - ... the linker invokes an the intermediate code generator ... operates on the intermediate code file ... include an intermediate code stream).

4. **As to claim 3** (incorporating the rejection in claim 1), Burch discloses the code generating system wherein the linker produces executable code (e.g., Fig. 3A, block 124 – Executable File).

5. **As to claim 4** (incorporating the rejection in claim 1), Burch discloses the code generating system wherein the linker sends only portions of the intermediate code to the code optimizer (e.g., Fig. 3A, blocks 304 – Linker Invokes, 113 – Intermediate Code

Generator 113, 122 – Intermediate Code, and 109 – Optimizer; Col. 8, Lines 8-11 - ... the linker invokes an the intermediate code generator ... operates on the intermediate code file ... include an intermediate code stream).

6. **As to claim 5** (incorporating the rejection in claim 1), Burch discloses the code generating system wherein the intermediate code generated by the compiler is stored in non-volatile memory (e.g., Fig. 6B, block 208 – Reuse Depository).

7. **As to claim 6** (incorporating the rejection in claim 1), Burch discloses the code generating system wherein the intermediate code generated by the compiler is stored in a magnetic storage device (e.g., Col. 6, Lines 25-27 - ... a tape drive ... diskette drive ...).

8. **As to claim 7** (incorporating the rejection in claim 1), Burch discloses the code generating system wherein the object files comprising object code and intermediate code may comprise a library (e.g., Fig. 1, block 114 – Library; Col. 3, Lines 57-61 - ... object code files ... combined with ... library code files ...).

9. **As to claim 8**, Burch discloses a method to optimize a program consisting of a plurality of source files, the method comprising:

- producing intermediate code (e.g., Fig. 3A, block 122 – Intermediate Code) associated with one or more of the plurality of source files (e.g., Fig. 3A, block 118 – Source Code);
  - producing object code (e.g., Fig. 3A, block 120 – Object Code) associated with one or more of the plurality of source files (e.g., Fig. 3A, block 118 – Source Code);
  - merging the intermediate code and the object code associated with each source file into an object file comprising object code plus intermediate code (e.g., Fig. 3A, blocks 1304 – Linker Invokes; 122 – Intermediate Code, and 120 – Object Code; Col. 8, Lines 36-42 - ... the object file ... included in the intermediate code file by including execution instructions in the object code stream); and
  - optimizing the program by providing the intermediate code in the object file to a code optimizer (e.g., Fig. 3A, blocks 122 – Intermediate Code, 109 – Optimizer, and 120 – Object Code).
10. **As to claim 9** (incorporating the rejection in claim 8), please refer to claim 6 as set forth accordingly.
11. **As to claim 10** (incorporating the rejection in claim 8), please refer to claim 5 as set forth accordingly.

12. **As to claim 11** (incorporating the rejection in claim 8), Burch discloses the method wherein optimizing the program further comprises receiving optimized intermediate code from the code optimizer and producing optimized executable code (e.g., Fig. 3A, blocks 304 – Linker Invokes, 113 – Intermediate Code Generator 113, 122 – Intermediate Code 122, 109 – Optimizer, and 124 – Executable File).

13. **As to claim 12**, Burch discloses a storage medium containing instructions that are executed by a processor and comprising:

- instructions that produce intermediate code (e.g., Fig. 3A, blocks 122 – Intermediate Code) from one or more source files (e.g., Fig. 3A, block 118 – Source Code);
- instructions that produce object code (e.g., Fig. 3A, block 120 – Object Code) from one or more source files (e.g., Fig. 3A, block 118 – Source Code);
- instructions that merge the intermediate code and the object code associated with one of the source files into a single intermediate plus object code file (e.g., Fig. 3A, blocks 304 – Linker Invokes; 122 – Intermediate Code, and 120 – Object Code; Col. 8, Lines 36-42 - .. the object file ... included in the intermediate code file by including execution instructions in the object code stream); and
- instructions that provide the intermediate code contained in the single intermediate plus object code file to a code optimizer (e.g., Fig. 3A, blocks 122 – Intermediate Code, 109 – Optimizer, and 120 – Object Code).

14. **As to claim 13** (incorporating the rejection in claim 12), please refer to claim 6 as set forth accordingly.

15. **As to claim 14** (incorporating the rejection in claim 12), please refer to claim 5 as set forth accordingly.

16. **As to claim 15** (incorporating the rejection in claim 12), Burch discloses the storage medium wherein the instructions that produce intermediate code to a code optimizer further comprises instructions for producing optimized object code (e.g., Fig. 3A, blocks 304 – Linker Invokes, 113 – Intermediate Code Generator 113, 122 – Intermediate Code 122, 109 – Optimizer, and 124 – Executable File).

17. **As to claim 16**, Burch discloses a computer system, comprising:

- a processor (e.g., Fig. 1, block 104 – Processor),
- memory coupled to the processor (e.g., Fig. 1, block 106 – Memory);
- a code generating system stored in the memory and executable on the processor and that produces intermediate code and object code that is stored into a single intermediate plus object code file and provided to a code optimizer (e.g., Fig. 3A, blocks 122 – Intermediate Code, 109 – Optimizer, and 120 – Object Code).

18. **As to claim 17** (incorporating the rejection in claim 16), please refer to claim 6 as set forth accordingly.



19. **As to claim 18** (incorporating the rejection in claim 16), please refer to claim 5 as set forth accordingly.

***Claim Rejections – 35 USC § 103(a)***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burch in view of Navin Kumar Sinha (Pub. No. US 2003/0079209 A1) (hereinafter 'Sinha' - art made of record)

21. **As to claim 2** (incorporating the rejection in claim 1), Burch does not explicitly disclose the code generating system wherein the code optimizer produces optimized intermediate code that has been processed by a optimization algorithm.

However, in an analogous art of *Code Optimization*, Sinha discloses the code generating system wherein the code optimizer produces optimized intermediate code that has been processed by a optimization algorithm (e.g., the algorithms .... Implemented at the intermediate code level ....; [0029] – *quicksort* algorithm; [0062]— [0069]).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Sinha into the Burch's system to further provide the code generating system wherein the code optimizer produces optimized intermediate code that has been processed by a optimization algorithm in Burch system.

The motivation is that it would further enhance the Burch's system by taking, advancing and/or incorporating Sinha's system which offers significant advantages that the optimization of compiled code is advantageously improved by separately optimizing loop code for loop repetitions, and implementing the resulting optimized code if such an implementation is deemed favorable as once suggested by Sinha (e.g., [0006]).

**Conclusion**

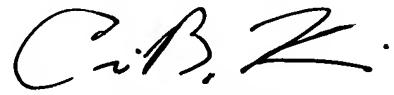
22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben C. Wang whose telephone number is 571-270-1240. The examiner can normally be reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on 571-272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BCW *fw*

January 29, 2008

  
**ERIC B. KISS**  
**PRIMARY EXAMINER**